ASSIGNMENT #1

General Instructions: Make sure that in all your programs the user is made to enter a valid input and the program rejects any invalid input. First five problems are compulsory. 6th problem if attempted (correctly/partially) will get you bonus marks.

Do not upload pdf files for submission. Instead paste your codes on moodle. If a question has parts, all of them should be attempted together.

Each question carries 10 marks **Maximum marks: 50**

1. Given the date and day of the week today, write a program which asks the user to enter a date in this year (past or present) and your program gives the day of week for that day.
2. Accept the salary of an employee from the user. Calculate the gross salary on the following basis:

Basic	HRA	DA .
1 - 4000	10%	50%
4001 - 8000	20%	60%
8001 - 12000	25%	70%
12000 and above	30%	80%

3. Ask the user to enter a number, check whether it's a perfect number or a perfect square or neither without the use of arrays. (Make sure you declare functions here)
4. Write a program to display Pascal's triangle for the number of rows entered by the user.
   Eg: If input number of rows: 5
   Expected Output is:

```
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

5. Write a python program to design and print the outputs for 3 inputs AND gate, OR gate and NOT gate.

6. In mathematics, **a continued fraction** is an expression obtained through an iterative process of representing a number as the sum of its integer part and the reciprocal of another number, then writing this other number as the sum of its integer part and another reciprocal, and so on. In a finite continued fraction (or terminated continued fraction), the iteration/recursion is terminated after finitely many steps by using an integer in lieu of another continued fraction. In

contrast, an infinite continued fraction is an infinite expression. In either case, all integers in the sequence, other than the first, must be positive. The integers $\mathbf{a_i}$ are called the coefficients or terms of the continued fraction. (SOURCE: WIKIPEDIA)

a) Write a program which finds and prints the first 6 coefficients (a_0, a_1, a_2, a_3, a_4, a_5, a_6) for π.
b) Can you generalize the program to find the first 'n' coefficients?
c) Can you generalize your program for finding the coefficients for any irrational number?